

### ABSTRACT OF THE DISCLOSURE

An article and method for producing extremely small pore inorganic membranes. The method enables reduction of the pore size of a porous inorganic membrane, such as metal oxides, metal carbides, metal nitrides and cermets. Mean pore diameters of below about 10 Å. Can readily and efficiently be achieved. After the conventional formation of an inorganic membrane, the pore size of the membrane is progressively reduced in a controlled manner to deposit one or more layers of an inorganic compound on the pore walls. This is done by exposing the membrane to the vapor of an inorganic precursor compound. The compound reacts with hydroxyl groups and or absorbed water molecules on the surface of the membrane and is thus bonded to the surface. Water vapor, oxygen, or vapors containing one or more oxygen ligands such as an alcohol are used to hydrolyze the deposited material to the inorganic membrane.